

WHAT IS CLAIMED IS:

1. A circuit simulation apparatus comprising:

a simulation executing unit which reads a circuit net list in which the connection descriptions of a circuit to be simulated are stored and which calculates the changes in the current and voltage of said circuit to be simulated, by referring to a transistor model, and

a diffusion-length-dependent parameter correcting unit which creates a corrected approximate expression regarding a diffusion-length-dependent parameter whose values change depending on the diffusion length for a transistor model created on the basis of transistors having a predetermined diffusion length and which calculates the correction value of said diffusion-length-dependent parameter for a transistor model having a diffusion length different from that of said transistor model by using said approximate expression.

2. A circuit simulation apparatus according to Claim 1, wherein said diffusion-length-dependent parameter includes a threshold voltage parameter and a mobility parameter.

3. A circuit simulation apparatus according to Claim 2, wherein the diffusion-length-dependent approximate expression of said threshold voltage parameter is a polynomial of the reciprocal of diffusion length.

4. A circuit simulation apparatus according to Claim 2, wherein the diffusion-length-dependent approximate expression of said threshold voltage parameter includes a

plurality of polynomials of the reciprocal of diffusion length, selectively applied to a plurality of ranges obtained by dividing the range of diffusion length values by one or more predetermined approximate critical diffusion length values.

5        5. A circuit simulation apparatus according to Claim 2, wherein the diffusion-length-dependent approximate expression of said mobility parameter is a polynomial of the reciprocal of diffusion length.

10        6. A circuit simulation apparatus according to Claim 2, wherein the diffusion-length-dependent approximate expression of said mobility parameter includes a plurality of polynomials of the reciprocal of diffusion length, selectively applied to a plurality of ranges obtained by  
15        dividing the range of diffusion length values by one or more predetermined approximate critical diffusion length values.

7. A transistor model creating method comprising the steps of:

creating a transistor model on the basis of the  
20        characteristics of a MOS transistor having a predetermined diffusion length,

extracting diffusion-length-dependent parameters for each of a plurality of MOS transistors having diffusion lengths different from said predetermined diffusion length  
25        and creating approximate expressions representing the diffusion length dependence of said diffusion-length-dependent parameters, and

calculating the correction values of said diffusion-

length-dependent parameters of a transistor used for simulation by said approximate expressions and using said correction values instead of said diffusion-length-dependent parameter values of said transistor model on the basis of  
5 the characteristics of said MOS transistor having said predetermined diffusion length.

8. A transistor model creating method according to Claim 7, wherein said diffusion-length-dependent parameter includes a threshold voltage parameter and a mobility  
10 parameter.

9. A transistor model creating method according to Claim 8, wherein the diffusion-length-dependent approximate expression of said threshold voltage parameter is a polynomial of the reciprocal of diffusion length.

15 10. A transistor model creating method according to Claim 8, wherein the diffusion-length-dependent approximate expression of said threshold voltage parameter includes a plurality of polynomials of the reciprocal of diffusion length, selectively applied to a plurality of ranges  
20 obtained by dividing the range of diffusion length values by one or more predetermined approximate critical diffusion length values.

11. A transistor model creating method according to Claim 8, wherein the diffusion-length-dependent approximate  
25 expression of said mobility parameter is a polynomial of the reciprocal of diffusion length.

12. A transistor model creating method according to Claim 8, wherein the diffusion-length-dependent approximate

expression of said mobility parameter includes a plurality of polynomials of the reciprocal of diffusion length, selectively applied to a plurality of ranges obtained by dividing the range of diffusion length values by one or more  
5 predetermined approximate critical diffusion length values.